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10/762,559	01/23/2004	Katsunori Takada	K06-165935M/TBS	3219

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EXAMINER

MCNELIS, KATHLEEN A

ART UNIT	PAPER NUMBER
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1742

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09/14/2007

PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No. 10/762,559	Applicant(s) TAKADA ET AL.	
	Examiner Kathleen A. McNelis	Art Unit 1742	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 02 August 2007.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-19 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-19 is/are rejected.
- 7) ☒ Claim(s) 2-4, 6-8 and 10-12 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____ |

Claims Status

Claims 1-19 remain for examination wherein claims 1, 5 and 8 are amended.

Acknowledgement of RCE

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(c), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.115, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 08/02/2007 has been entered.

Status of Previous Objections/Rejections

The following objections and rejections are withdrawn in view of amendments to or cancellation of claims:

Claim 20 as objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim,

Claim 21 as rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement,

Claims 1 to 8, 15, 20 and 21 under 35 U.S.C. 102(b) as being anticipated by Iguchi et al. (U.S. Pat. No. 6,270,596),

Claims 20 and 21 under 35 U.S.C. 103(a) as being unpatentable over Iguchi et al. (U.S. Pat. No. 6,270,596).

The following rejections are maintained:

Claims 1 to 19 under 35 U.S.C. 103(a) as being unpatentable over Iguchi et al. (U.S. Pat. No. 6,270,596).

Examiner's Comments

Examiner notes that the claims as originally submitted recite a Ti limit of 0.005 – 0.10%. However in the 9/30/2005 the limit was changed to 0.005 – 0.010 %. Examiner believes this to be a typographical error since the limit was not noted as amended, and further since all of the inventive steel compositions listed in Table 1 of the specification contain greater than 0.010 % Ti. For purposes of furthering examination, the range of 0.005 – 0.10 % has been assumed based on the original disclosure. Correction is required.

DETAILED ACTION

Claim Objections

Claims 2-4, 6-8 and 10-12 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claim(s), or amend the claim(s) to place the claim(s) in proper dependent form, or rewrite the claim(s) in independent form.

Independent claims 1, 5 and 9 now recite “wherein the steel is devoid of Cr, Cu, Ni and Al”, however depending claims 2-4, 6-8 and 10-12 recite the addition of these elements.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the enablement requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to enable one skilled in the art to which it pertains, or with which it is most nearly connected, to make and/or use the invention.

The amendments to claims 1, 5 and 9 recite: "wherein the steel is devoid of Cr, Cu, Ni, and Al". While the specification is enabling for making steel without the addition of Cr, Cu and Ni, it does not address removal of trace impurity levels of these elements. Further, the specification recites on p. 15 that Al is added to the steel for deoxidation, however there is no enablement for complete removal of the Al such that the resulting steel is "devoid" of Al. This is a lack of enablement rejection.

Depending claims 2, 6 and 10 require the addition of one or more Cu, Ni or Cr, however independent claims 1, 5 and 9 now recite that the steel is devoid in these elements. These limitations appear to be contradictory.

Claims 1-19 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

The amendments to claims 1, 5 and 9 recite: "wherein the steel is devoid of Cr, Cu, Ni, and Al". While the specification discloses that the addition of Cr, Cu and Ni is optional, p. 15 of the specification recites the addition of Al. The specification therefore does not appear to support an embodiment that does not have Al added. Further, the specification does not appear to disclose refining of the steel to remove trace impurities of Cr, Cu, Ni and Al, or test data showing that such are absent. It is unclear therefore how the specification would support a steel "devoid" of these elements. This is a new matter rejection.

Claims 1, 5 and 9 now recite: 0.005 – 0.010 wt% Ti. Examiner notes that the claims as originally submitted recite a Ti limit of 0.005 – 0.10%. However in the 9/30/2005 the limit was changed to 0.005 – 0.010 % and all of the inventive steels listed in Table 1 of the specification

Art Unit: 1742

contain more than 0.010% Ti. Examiner believes this to be a typographical error since the limit was not noted as amended, and further since all of the inventive steel compositions listed in Table 1 of the specification contain greater than 0.010 % Ti. For purposes of furthering examination, the range of 0.005 – 0.10 % has been assumed based on the original disclosure.

Claim Rejections - 35 USC § 103

The text of those sections of Title 35, U.S. Code not included in this action can be found in a prior Office action.

Claims 1 to 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Iguchi et al. (U.S. Pat. No. 6,270,596).

Iguchi et al. is applied to claims 1-19 as discussed in the 03/08/2007 Office action.

Regarding the amended limitation to claims 1, 5 and 9 that the steel is devoid of Cr, Cu, Ni and Al, Iguchi et al. discloses a steel for producing a shaft with general composition (abstract and col. 8 lines 29-48) overlapping the claimed ranges as follows:

Element	Composition (wt%)		
	Instant claims 1, 5 and 9	Iguchi et al.	Overlap
C	0.45 – 0.55	0.47 – 0.55	0.47 – 0.55
Si	0.1 – 0.5	0.03 – 0.15	0.1 – 0.15
Mn	0.5 – 1.2	0.20 – 0.5	0.5
P	≤ 0.025	Not recited	0-impurity
S	≤ 0.025	0.005 – 0.035	0.005-0.025
Mo	0.15 – 0.25	0.08 – 0.3	0.15-0.25
B	0.0005 – 0.005	0.005 – 0.035	0.005
Ti	0.005 – 0.10 ¹	0.05-0.2	0.1 – 0.2
N	≤ 0.015	≤ 0.01	≤ 0.01
Cr	Devoid	Not recited	0
Cu	Devoid	Not recited	0
Ni	Devoid	Not recited	0
Al	Devoid	0.005-0.05	Close range
Fe	balance	balance	Balance

¹ See Examiner's Comments section above regarding claimed limit for Ti.

The range of carbon and nitrogen disclosed by Iguchi et al. is within the claimed ranges. The ranges of Si, Mn, S, Mo, B, and Ti disclosed by Iguchi et al. overlap the respective claimed ranges; therefore a prima facie case of obviousness exists (M.P.E.P § 2144.05). For example, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use between 0.1 and 0.15 wt% Si in the steel of Iguchi et al., since Iguchi et al. discloses equal utility over the range of 0.03 to 0.15 wt%. Since Iguchi et al. does not recite values for P, Cr, Cu or Ni, the absence of such is within the scope disclosed by Iguchi et al. Iguchi et al. discloses the presence of unavoidable impurities (col. 8 lines 29-48). Since P is well known to be an impurity in iron, it is possible that although not recited, at least some P is present in the steel of Iguchi et al. Table 1 (cols. 5 and 6) lists both inventive and comparative steels and teaches a range of between 0.011 to 0.015 wt% P, which is within the claimed range of ≤ 0.025 . Further, the range of 0 to impurity level P overlaps the claimed range of $\leq 0.025\%$ P; therefore a prima facie case of obviousness exists (M.P.E.P § 2144.05). The range of 0.005 to 0.05 wt% Al disclosed by Iguchi et al. is close enough to “devoid” that lacking evidence of the criticality of the claimed range “devoid”, one of ordinary skill in the art would expect the same results (M.P.E.P § 2144.05).

Values of C, Si, Mn, Cr and Mo can be selected from the overlapping ranges which satisfy the relationship that $0.80 \leq C_{eq} \leq 0.95$ when calculated. Values of f can be selected from the overlapping ranges of C, Si, Mn, Cu, Ni and Cr such that f value ≤ 1.0 when calculated.

Claims 1-4 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Watari et al. (U.S. Pat. No. 6,475,305).

Regarding claim 1, Watari et al. discloses a shaft steel having a general composition (abstract and col. 7 line 40 – col. 9 line 11) overlapping the instant claimed ranges as follows:

Element	Composition (wt%)		
	Instant claims 1, 5 and 9	Watari et al.	Overlap
C	0.45 – 0.55	0.05 – 0.55	0.45 – 0.55
Si	0.1 – 0.5	0.5 – 2.5	0.5
Mn	0.5 – 1.2	0.01 – 2.0	0.5 – 1.2
P	≤ 0.025	≤ 0.035	≤ 0.025
S	≤ 0.025	0.005 – 0.2	0.005 – 0.2
Mo	0.15 – 0.25	Optional: 0 – 1.5	0.15 – 0.25
B	0.0005 – 0.005	Optional: 0-0.01	0.0005 – 0.005
Ti	0.005 – 0.10 ¹	Optional: 0-0.04	0-0.04
N	≤ 0.015	≤ 0.015	≤ 0.015
Cr	Devoid	Optional: 0-2.0	0
Cu	Devoid	Optional: 0-1.5	0
Ni	Devoid	Optional: 0-2.0	0
Al	Devoid	Optional: 0-0.04	0
Fe	balance	balance	balance

The ranges of S and N disclosed by Watari et al. are within the instant claimed ranges. The ranges of C, Si, Mn, P, S, Mo, B, Ti, Cr, Cu, Ni, Al and Fe overlap the instant claimed ranges; therefore a prima facie case of obviousness exists (M.P.E.P § 2144.05). Although the relationships for C_{eq} and f value are not recited in Watari et al., values of C, Si, Mn, Cr, Cu, Ni and Mo can be selected from the overlapping ranges which satisfy the relationships that $0.80 \leq C_{eq} \leq 0.95$ and $f_{value} \leq 1.0$ when calculated. Watari et al. discloses a microstructure comprising ferrite, pearlite and bainite (col. 12 lines 40-67).

With respect to claim 2, Watari et al. discloses the optional addition of 0-1.5 % Cu, 0-2.0% Ni and 0-2.0 % Cr as discussed above regarding claim 1, which overlap the instant claimed ranges; therefore a prima facie case of obviousness exists (M.P.E.P § 2144.05).

With respect to claims 3 and 4, Watari et al. discloses the optional addition of 0-0.04 % Al as discussed above regarding claim 1 and 0-0.1 % Nb (col. 8 lines 37-46), which overlap the instant claimed ranges; therefore a prima facie case of obviousness exists (M.P.E.P § 2144.05).

With respect to claim 13, Watari et al. discloses that the microstructure comprises between 10 and 80 % ferrite (col. 12 lines 39-58) which overlaps the claimed range of 40% or less; therefore a prima facie case of obviousness exists (M.P.E.P § 2144.05).

Response to Arguments

Applicant's arguments filed 07/09/2007 regarding maintained rejections have been fully considered but they are not persuasive.

Arguments are summarized as follows:

1. Steel No. 7 of Iguchi et al. does not meet the amended limitation of a steel devoid of Cr, Cu, Ni and Al.
2. All of the examples in Table 1 of Iguchi include Cr, Cu, Ni and Al.

Examiner's responses are as follows:

1. The general disclosure of Iguchi et al. suggests the amended claim language of a steel devoid in Cr, Cu, Ni and Al. However, note that depending claims 2-4, 6-8 and 10-12 still recite the addition of Cu, Ni, Cr and Al, therefore the disclose Steel No. 7 appears to still read on these claims.
2. The disclosure of Iguchi et al. is not limited to the examples in the cited Table 1. The steel as claimed by Iguchi et al. suggests the instant claimed limitations as discussed above in the grounds for rejection.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kathleen A. McNelis whose telephone number is 571 272 3554. The examiner can normally be reached on M-F 8:00 AM to 4:30 PM.

Art Unit: 1742

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Roy King can be reached on 571-272-1244. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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09/12/2007

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